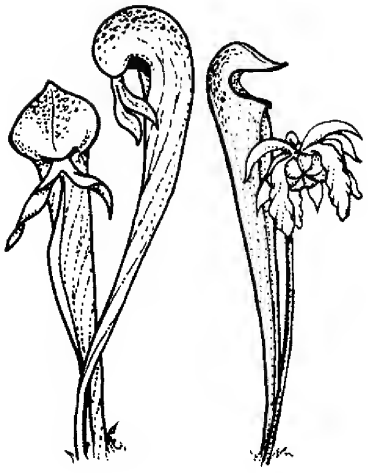
CARNIVOROUS PLANT NEWSLETTER

Journal of the International Carnivorous Plant Society

Volume 44, No. 1 March 2015



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Journal of the International Carnivorous Plant Society
www.carnivorousplants.org

Volume 44, Number 1
March 2015

Front Cover: *Dionaea muscipula* 'Purple Haze'. Photo by John M. Kotleba. Article on page 33.

Back Cover: *Sarracenia* 'Legacy'. Photo by Robert Co. Article on page 35.

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Date of effective publication of the December 2014 issue of Carnivorous Plant Newsletter: 1 December 2014.

The ICPS is the International Cultivar Registration Authority (ICRA) for the names of cultivated carnivorous plants according to the International Code of Nomenclature for Cultivated Plants. Send relevant correspondence to the ICPS, Inc.

Carnivorous Plant Newsletter is published quarterly in March, June, September, and December by the ICPS, Inc., 2121 N. California Blvd., Suite 290, Walnut Creek, CA 94596, USA. Periodicals postage paid at Richmond, CA and additional mailing offices. Postmaster: Send address changes to ICPS, Inc., 2121 N. California Blvd., Suite 290, Walnut Creek, CA 94596, USA. Printed by Allen Press, Inc., 810 E. 10th Street, Lawrence, KS 66044. Logo and masthead art: Paul Milauskas.
 ISSN #0190-9215

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11TH ICPS Conference 2016

Call for proposals

After the successful and exciting conference in Cairns, Australia, it is about time to begin thinking about the next ICPS conference scheduled for 2016. According to the principle of fair global distribution and the set schedule, the next venue should preferably be located in Europe/Africa/Middle East.

If you or your society feels this should be your turn, please send a proposal by email to marcel@carnivorousplants.org. Your proposal should be received by the 15th of March 2015.

Please supply in your proposal information about the person/society (with contact details, preferably email) who would like to organize the conference, the intended venue (capacity, equipment), travel details, accommodation, field trip opportunities, and any ideas you find useful to assist the ICPS board of directors to select your proposal.

Please understand that, while potentially interesting from a theoretical perspective, proposals without a direct (personal) commitment to organize a conference cannot be accepted for serious consideration (or further discussion) by the board.

The ICPS is prepared to distribute information on the forthcoming event to its members and, if requested, monetary support to cover advance expenses can be loaned. The conference should, however, be economically self-sustained so the initial financial support by the ICPS can be reimbursed so funds will then be available for subsequent conferences.

If you have any questions about what should be in a proposal or have questions about what to expect when you try to set up for a conference you can ask your questions by e-mail to marcel@carnivorousplants.org. A "Conference-manual" containing tips, tricks, and hard-earned experience of those who organized preceding conferences is available to help you along the way.

Thank you very much for your consideration.

Marcel van den Broek
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An updated taxonomic treatment of the natural hybrids of *Sarracenia* L. (Sarraceniaceae)

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Keywords: natural plant hybrids, *Sarracenia*, *Sarracenia* hybrids, Sarraceniaceae.

Abstract: Presently there exists confusion concerning the legitimacy and taxonomy of the named natural hybrids of *Sarracenia*. One reason for this confusion centers on the unsettled taxonomy of what may be called the *S. rubra* and the *S. purpurea* complexes. More specifically, hybrids derived from either or both of these two complexes are those for which the taxonomy is most unclear. Additionally, in some cases, collection data is scant or missing. Drawn from literature, collection records and field observations, a review of the named natural hybrids of *Sarracenia* is presented.

The five taxa included in the *S. rubra* complex are all conservatively treated in the NRCS, USDA (2014) website as subspecies of *S. rubra* Walter. However, Mellichamp and Case (2009) divided them into three separate species (two with subspecies). McPherson and Schnell (2011) placed *S. alabamensis* Case & R.B. Case and *S. jonesii* Wherry as subspecies of *S. rubra*.

Mellichamp and Case's (2009) taxonomy is based largely on morphological and ecological factors. That is, the five members of the complex have broadly disjunct ranges that correlate with distinctive morphology. In that sense, it is a practical taxonomy although it has, as yet, no molecular-based systematic support. The question then becomes, how to treat the various hybrids from members of this complex? That is, should the members of the *S. rubra* complex be treated with some level of distinction or should they be treated as mere variants of a single species as much of the molecular evidence currently suggests?

For purposes of this paper, the five members of the *S. rubra* complex will be recognized as distinct in keeping with the taxonomy of Mellichamp and Case (2009). This decision is supported largely by practical considerations. Specifically, the recognizable morphology of each, correlated with their respective disjunct ranges supports their distinction based on traditional and ecological grounds.

In contrast, molecular evidence supports the distinction among three members of the *S. purpurea* complex (Neyland & Merchant 2006, Ellison *et al.* 2012). Therefore, Mellichamp and Case's (2009) taxonomy that distinguishes *S. purpurea* L. subsp. *venosa* (Raf.) Wherry, *S. purpurea* subsp. *purpurea* and *S. rosea* Naczi is well grounded. It is noted, however, that McPherson and Schnell (2011) placed *S. rosea* as a variety of *S. purpurea* subsp. *venosa*.

It is the goal of this paper to provide a brief history and description of the named natural hybrids of *Sarracenia*. For purposes of this paper, this list consists of the 20 natural hybrids listed by Ellison *et al.* (2014).

Materials and Methods

This study is derived from literature and herbaria searches. Additionally, information from field observations and new collections by the authors augment this study. A brief discussion of each recognized natural hybrid is listed in the following section. Specimens were collected using standard herbarium techniques. Taxonomy follows Mellichamp and Case (2009). Herbarium abbreviations follow Thiers (2014).

Results and Discussion

From this study, information on 20 named natural hybrids of *Sarracenia* is presented. This set of hybrids follows Ellison *et al.* (2014). The following alphabetic list includes the parent names, the type locality and type specimen for each. A brief description with historical and updated information is included.

S.* × *ahlesii C.R.Bell & F.W.Case
Parents: (*S. alata* (Alph. Wood) Alph. Wood × *S. alabamensis* Case & R.B.Case subsp. *wherryi* (D.E.Schnell) R.B.Case.
Type locality: Wet meadow, five miles southeast of Fruitdale, Washington County, AL, 1955.
Holotype: Bell *1495* (NCU).

Mature leaves are erect and reddish. Sepals are green and suffused with maroon; the petals are yellow with maroon shading (Bell & Case 1956). The holotype, which can be viewed online, consists of three flowers and no leaves. Bell and Case also tentatively identified a collection (Bell 1456a) from near Agricola, MS as *S.* × *ahlesii*. However, that specimen was later identified as *S.* × *exornata* and currently resides in the NCU herbarium. No other collections are known to the authors.

S.* × *areolata Macfarlane
Parents: (*S. leucophylla* Raf. × *S. alata*).
Lectotype: Macfarlane *s.n.* (NCU).
Type locality: Theodore, Mobile County, AL, 1909.

Erect leaves are mostly green with darker veins and prominent white areoles on the operculum and peristome region. Sepals are mostly green and suffused with red; the petals are typically red. This hybrid is vegetatively similar to *S.* × *moorei*. Because the parents freely hybridize and their progeny easily backcross (Bell & Case 1956), introgression produces a material amount of both leaf venation and flower color variation. Common within its small range, this hybrid has been collected in Jackson County, MS and Mobile County, AL. The lectotype can be viewed online.

S.* × *casei Mellichamp
Parents: (*S. psittacina* Michx. × *S. alabamensis* subsp. *wherryi*).
Type locality: Along US 45 just north of Deer Park, Washington County, AL, 1985.
Holotype: Mellichamp *s.n.* (UNCC).

The semi-decumbent leaves of this hybrid are thin textured and faintly hairy. Young leaves are somewhat bronze colored like those of its *S. alabamensis* subsp. *wherryi* parent (pers. obs.). The opercula are bonnet-shaped with translucent areoles derived from its *S. psittacina* parent. Flowers are small (Mellichamp 2008) with (presumably) red petals and sepals. No information with respect to fragrance is known. The senior author in Baldwin County, AL discovered a second population in

2014. Because both of its parents bloom at about the same time in early May, this hybrid is readily produced. However, because of the restricted range of *S. alabamensis* subsp. *wherryi* this hybrid is rare. Its bonnet-shaped operculum is a character also evinced in *S.* × *formosa*, *S.* × *gilpini* and *S.* × *wrigleyana.* We note that among each of these hybrids with bonnet-shaped opercula, some individual leaves do not completely open along the suture lines. When this occurs, the leaves appear mostly closed like their *S. psittacina* parent. Both types of leaves can occur on the same individual plant.

S.* × *catesbaei Elliott
Parents: (*S. flava* L. × *S. purpurea* subsp. *venosa*).
Type locality: Along the margins of rivulets amidst the high sand hills of Chesterfield district in SC.
Neotype: Macbride *s.n.* (CHARL).

With spreading, collar-shaped opercula, the semi-decumbent leaves are marked with red or purple. Each leaf typically exhibits a dark splotch of purple or red on the base of the operculum, a characteristic of its *S. flava* parent. Sepals and petals are red, a characteristic of its *S. purpurea* subsp. *venosa* parent. However, Bell (1952) noted that petals might have tints of yellow, a contribution from *S. flava*. Eliot and Stauffer (1951) provide a good image of this hybrid in its native habitat. Although plants have been collected over a large range that includes the Piedmont and Coastal Plain of GA, SC and NC, this hybrid is not common (Bell 1952; Mellichamp & Case 2009). Its spreading operculum (not pinched in the middle), is a character also evinced in the vegetatively similar *S.* × *chelsonii*, *S.* × *exornata*, and *S.* × *swaniana*. Although the neotype collection sheet is not dated, the collection was made in the early 1800s as it is referenced (as a species) by Elliot (1824). The actual specimen remains in good condition. Additional collections were located in the UNC, UNCC, and US herbaria.

S.* × *charlesmoorei Mellichamp
Parents: (*S. jonesii* Wherry × *S. purpurea* subsp. *purpurea*).
Type locality: Henderson County, NC, 2007.
Holotype: Mellichamp *s.n.* (UNCC).

Reddened or purplish leaves are semi-decumbent with undulated collar-shaped opercula that are pinched in the middle. Sepals and petals are red. This hybrid has been collected in three counties in the mountains of NC. Plants collected by Wherry in Henderson County were included in Bell's (1952) neotypification of *S.* × *chelsonii*. However, with the acceptance of *S. jonesii* as a distinct species, Mellichamp (2008) recognized *S.* × *charlesmoorei* as a distinct taxon and separate from *S.* × *chelsonii*. This hybrid is rare due to the loss of the montane bogs inhabited by its *S. jonesii* parent (Mellichamp 2008). Pinched in the middle, the opercula of this taxon are reminiscent of a traditional Dutch woman's cap. This shape is a character also evinced in the vegetatively similar *S.* × *mitchelliana* and *S.* × *naczii*.

S.* × *chelsonii Veitch ex Masters
Parents: (*S. rubra* subsp. *rubra* × *S. purpurea* subsp. *venosa*).
Type locality: Eastern shore of Scotland Lake, Scotland County, NC, 1947.
Neotype: Wellman *s.n.* (NCU).

The leaves of this hybrid are semi-decumbent with spreading, collar-shaped opercula. Sepals and petals are red. Attributed to a horticulturally engineered hybrid, the name *S.* × *chelsonii* first appeared in the literature in 1878. A natural specimen was first discovered in 1933 by Wherry in southeastern North Carolina (Bell 1949). The specimen collected in 1947 by Wellman from the

western edge of the coastal plain in Scotland County, NC was designated as the neotype by Bell (1952). This collection consists of a single leaf. An additional specimen, also collected by Wellman at the type locality, consists of a single leaf and a single flower. Housed at NCU, these two are the only known specimens of this natural hybrid. The neotype may be viewed online.

S.* × *courtii Veitch ex Wilson
Parents: (*S. purpurea* × *S. psittacina*).

Plants from this cross are known from horticulture. However, Sheridan and Scholl (1993) reported that they had observed a natural population of about ten individuals of what they called *S.* × *courtii* along a road embankment in Liberty County, FL in 1989. Because such a hybrid observed here would have *S. rosea* as its parent (not *S. purpurea*), these plants would be distinct from *S.* × *courtii*. Because no collection material apparently was made, this hybrid reported from Florida remains unconfirmed. The typically large temporal difference in the blooming times of the parents presumably would make such a hybrid, if it exists, quite rare.

S.* × *excellens W.Bull.
Parents: (*S. leucophylla* × *S. minor*).
Type: None.

This hybrid was first named and described by Nicholson (1887). Commonly produced in horticulture, plants are erect with prominent areoles and somewhat arching opercula. The natural occurrence of this hybrid has been reported from the small area in the Florida Panhandle where the ranges of the two respective parents just barely overlap. However, our efforts to locate any natural collection material were unsuccessful.

S.* × *exornata W.Bull.
Parents: (*S. alata* × *S. rosea*).
Type locality: Theodore, Mobile County, AL, (year unknown).
Neotype: Pennell *s.n.* (PENN).

Prominently marked with red or purple veins, each leaf is semi-decumbent with a spreading, collar-shaped operculum. Bell (1952) described the flowers as having red-brown sepals (sometimes tinged with green) and petals that are either red or rose with yellow margins. This hybrid has been collected in Mobile County, AL near Theodore and Spring Hill (Bell 1952). Bell also collected this hybrid in a bog five miles south of Agricola, MS in George County (Bell & Case 1956). The USDA, NRCS (2014) distribution map indicates that this hybrid also occurs in Washington County, MS. In 2014, the senior author observed a population in Jackson County, MS. Several specimens are housed at the NCU herbarium. The neotype was located in the PH herbarium. It is noted that the PENN herbarium was incorporated into the PH herbarium in 1974.

S.* × *farnhamii Farnham **nothosubsp. *bellii*** (Mellichamp) Neyland, Bushnell & Tangkham comb. et stat. nov.
Basionym: *S.* × *bellii* Mellichamp, Carniv. Pl. Newslett. 37: 114 (2008)
Note: The name *S.* × *farnhamii* was originally based on a hybrid between *S. leucophylla* (subsp. *leucophylla*) and *S. rubra* subsp. *rubra*. The plant Mellichamp (2008) described as *S.* × *bellii* (=*S. leucophylla* × *S. rubra* subsp. *gulfensis*) differs from *S.* × *farnhamii* in the strict sense at the rank of subspecies.
Parents: (*S. leucophylla* × *S. rubra* subsp. *gulfensis*).

Type locality: West side of Hwy. 87 just north of Yellow River, Santa Rosa County, FL, 2008.
Holotype: Mellichamp *s.n.* (UNCC).

Similar to those of its *S. leucophylla* parent, this hybrid's leaves exhibit white areoles about the peristome and operculum. The opercula are wavy margined and longer than wide. The narrow operculum is a characteristic of its *S. rubra* subsp. *gulfensis* parent. Somewhat similar, the leaves of *S.* × *farnhamii* nothosubsp. *bellii* are consistently longer (to 42cm) than those of *S.* × *readei* (Mellichamp 2008). Although the authors know of no collections with flowers, the sepals and petals are likely red (as in both parents) and probably intermediate in size. This is apparently the only site (along power lines) where this rare hybrid has been collected. At this site, the senior author in 2014 confirmed that *S.* × *farnhamii* nothosubsp. *bellii* is still present.

S.* × *formosa Veitch ex Masters
Parents: (*S. minor* Walter × S. *psittacina*).
Type locality: Moist pine barren, near Fitzgerald, Irwin County, GA, 1904.
Neotype: Harper *2211* (US).

Leaves of this hybrid are semi-decumbent with bonnet-shaped opercula and translucent areoles. Flowers are distinctive in that the sepals are primarily green and the petals are mostly red. The neotype may be viewed online. Originally named for a horticulturally derived plant in 1811, it was not until 1904 that a natural hybrid was collected. Since that time, additional collections have been made from southeastern GA. Collections also have been made in Nassau and Baker Counties in northeastern FL. Although previously not reported from Duval County, FL, the senior author observed this hybrid in bloom on the University of North Florida campus. These plants are not rare and are most easily detected in the field by their bicolor blooms.

S.* × *gilpinii Bell & Case
Parents: (*S. psittacina* × *S. rubra* subsp. *gulfensis*).
Type locality: Savanna north of Yellow River and east of Florida highway 87; Santa Rosa County, FL, 1955.
Holotype: Bell *1523* (NCU).

This hybrid produces a rosette of semi-decumbent leaves; each bears a bonnet-shaped operculum with translucent areoles. Flowers were described by Bell and Case (1956) as small, faintly sweet-scented, with maroon sepals and petals. Attempts to locate the holotype (or any other naturally-collected specimens) were unsuccessful. A photograph, probably from the original collection, is included in the paper by Bell and Case (1956). According to Mellichamp (2008) this specimen was collected in the same bog with *S.* × *farnhamii* nothosubsp. *bellii* (see above). Although the senior author did manage to find *S.* × *farnhamii* nothosubsp. *bellii* there in 2014 (see above), he found no individuals of *S.* × *gilpinii*. Therefore, this hybrid would appear to be extremely rare or nonexistent in the wild. Assuming that the holotype is lost, then a neotype should be designated; however, we were unable to find any other herbarium collections. Designating the above mentioned photograph, as the neotype would be allowed under the article 9.6 of the ICBN (McNeil *et al.* 2011). Differences in flowering period between the two parents and the restricted range of *S. rubra* subsp. *gulfensis* are factors that contribute to the rarity of this hybrid.

S.* × *harperi C.R.Bell
Parents: (*S. flava* × *S. minor*).
Type locality: Sandy bog in pine-barrens near Bloys, Bulloch County, GA, 1901.
Neotype: Harper *855* (US).

Leaves are erect. Exhibiting a darkened splotch near its base, each operculum is revolute. Interestingly, the prominent translucent areoles of its *S. minor* parent are absent. Flowers unsurprisingly exhibit the green sepals and yellow petals of both its parents. Only a few collections from GA and SC were found during this study. Although the parents are sympatric over a large area of northern FL east of the Chattahoochee-Apalachicola River system, it is curious that there are no known collections from that state. The neotype can be viewed online.

S.* × *mitchelliana W.Bull.
Parents: (*S. leucophylla* × *S. rosea*).
Type locality: Bog 2.5 miles west of Florida state line by U.S. 90, Baldwin County, AL, 1948.
Neotype: Bell *548* (NCU).

The leaves of this robust hybrid are semi-decumbent, each with a collar-shape operculum that is pinched in the middle. When young, white areoles about the operculum and peristome are evident. However, as the leaf ages, it becomes dark purple with the areoles becoming obscured. With its red sepals and pink petals, flowers are similar to its *S. rosea* parent. Flowers are nearly scentless (pers. obs.). Plants have been collected in Baldwin County AL, adjacent Escambia County, FL and from a disjunct population in Liberty County, FL. Bell (1952) stated that Harper (1918) found this plant in Walton County FL but we could not locate a collection from that county. The curious thing about this hybrid is that it is fairly common in Escambia County, FL and near its type locality in AL, but it seems to be rare or nonexistent in other areas where its parents are sympatric. The senior author observed plants at several locations in Escambia County, FL and some within the city limits of Pensacola in 2014. Considerable variation in leaf shape, color and size, probably due to introgression, is evident in plants that inhabit Splinter Hill Bog, Baldwin County, AL (pers. obs.).

S.* × *moorei Moore ex Masters
Parents: (*S. flava* × *S. leucophylla*).
Type locality: Sandy bog southeast of Americus, Sumter County, GA, 1901.
Neotype: Harper *1021* (US).

Marked with red veins, leaves are erect with white areoles about the peristome and operculum. Sepals are green and suffused with pale red; the petals are likewise pale red. This common hybrid's range extends from southern AL to northwestern FL and southwestern GA. Because its parents freely hybridize and introgression appears common, a myriad of morphological forms are produced. In 2013 and 2014, the senior author observed much variation in color and venation patterns among individuals of the Garcon Point peninsula, Santa Rosa County, FL. In 2013, this hybrid was collected for the first time in Escambia County, FL by the senior author in the type locality of *S.* × *naczii*. The neotype can be viewed online. Vegetatively similar, *S.* × *areolata* also produces a broad spectrum of variants.

S.* × *naczii Mellichamp
Parents: (*S. flava* × *S. rosea*).
Type locality: South side of O.C. Phillips Rd., ca 3 miles east of Perdido River, Escambia County, FL, 2007.
Holotype: Mellichamp *s.n.* (UNCC).

The leaves of this robust hybrid are semi-decumbent, each with a collar-shape operculum that is pinched in the middle. Heavily marked with red or purple veins, each leaf bears a darkened splotch at the base of its peristome like that of its *S. flava* parent. Flowers are typically pale yellow with

a pink cast (Mellichamp 2008). In 2014, the senior author observed plants in the type locality in Escambia County, FL and in a second location in Walton County, FL.

S.* × *popei Masters
Parents: (*S. flava* × *S. rubra* subsp. *rubra*).
Type locality: Carthage, Moore County, NC, 1926.
Neotype: Harriot *s.n.* (PH).

Erect leaves are light green with maroon markings. Large flowers exhibit maroon sepals with maroon petals that are edged with yellow (Bell 1952). An illustration of the flower and leaf is shown in Bell's (1952) paper. Although they are sympatric over a large range, mostly in the Carolinas, the two parent species produce few, if any, natural hybrids. Indeed, there are no other known natural hybrid collections between *S. flava* and any other member of the *S. rubra* complex. Neither the neotype nor any other collection of this taxon was located.

S.* × *readei Bell
Parents: (*S. leucophylla* × *S. alabamensis* subsp. *wherryi*).
Type locality: Deer Park, Washington County, AL. 1913.
Lectotype: Reade *5789* (PENN).

Prominently marked with the white areoles from its *S. leucophylla* parent, the leaves of this rare hybrid are slender and reddened like those of its other parent *S. alabamensis* subsp. *wherryi*. Flowers are maroon and intermediate in size (Bell & Case 1956). The lectotype was located in the PH herbarium. Only two other collections known to the authors (Bell 1496 and Case P-63) were not located. Due to the restricted range of *S. alabamensis* subsp. *wherryi*, this hybrid is rare.

S.* × *rehderi C.R.Bell
Parents: (*S. minor* × *S. rubra* subsp. *rubra*).
Type locality: Damp savannahs about 12 miles southwest of Shallottee, Brunswick County, NC, 1952.
Neotype: Rehder *s.n.* (NCU).

With reddish veins, erect leaves are green with white areoles about the peristome and operculum. Similar to those found in *S.* × *harperi*, the opercula are slightly revolute. Flowers are fragrant. Red sepals and petals are edged with yellow (Bell 1952). Bell reported that this hybrid was first collected by Wherry in 1923 in Candler County, GA but no herbarium specimen could be located. The neotype was collected in 1951 and consists only of leaves; however, a black and white photograph of the plant in flower is attached. An image of the neotype is available online. Plants also have been collected in Barnwell and Colleton Counties, SC.

S.* × *swaniana Bull ex W.Robinson
Parents: (*S. minor* × *S. purpurea* subsp. *venosa*).
Type locality: From damp savanna about 12 miles southwest of Shallotte, Brunswick County, NC, 1952.
Neotype: Rehder *s.n.* (NCU).

Typical of other hybrids from the *S. purpurea* complex, leaves are semi-decumbent with spreading, collar-shaped opercula. A few translucent areoles about the base of the operculum are present (Bell 1952). Green sepals are suffused with red; petals are completely red. First mentioned as a horticulturally derived plant in 1887, it was not until Eliot and Stauffer's (1951) publication that a natu-

ral hybrid was noted in the literature. Plants also have been collected in Bladen County, NC (Bell & Case 1956). The few collections of this plant suggest its rarity. The neotype can be viewed online.

S.* × *wrigleyana S.G.
Parents: (*S. leucophylla* × *S. psittacina*).
Type locality: Fowl River Road, south of Theodore, Mobile County, AL, 1954.
Neotype: Case P*62* (NCU).

The leaves of this rare hybrid are semi-decumbent; each bears a bonnet-shaped operculum with translucent areoles. Like both its parents, the sepals and petals are red; however, the flowers are intermediate in size. This plant was first collected by Wherry near Fruitdale in Washington, County, AL in 1932 (Bell & Case 1956); however, this collection could not be located. The neotype, which can be viewed online, originally consisted of leaves only. However, a flower was added later. The flower is from the original specimen that bloomed at the University of Michigan greenhouse in 1955. Bell and Case (1956) also listed a specimen from Escambia County, FL; however, that specimen could not be located. An additional specimen from Bay County, FL was located at FLAS 97441 (Beckner *et al. 1506*). Differences in flowering period between the two parents appear to be the major impediment in producing this hybrid.

Conclusion

From this study it is clear that some natural hybrids of *Sarracenia* are common and others are rare. Judging by the large numbers of horticulturally engineered hybrids, there does not appear to be any genetic incompatibility among the species of *Sarracenia* with respect to their ability to produce fertile hybrids. Indeed, hybrid swarms are common in the field (Ellison *et al.* 2014).

Natural hybrids occur in numbers when the two sympatric species are common and have at least some overlap in their respective periods of flowering. Examples include *S.* × *areolata*, *S.* × *formosa*, *S.* × *mitchelliana*, and *S.* × *moorei.*

Conversely, when these conditions are not met, natural hybrids are reduced or absent. For example, a temporal difference in floral period between parents fosters reproductive isolation. *Sarracenia* × *wrigleyana* provides a good example. Specifically, although *S. leucophylla* and *S. psittacina* occur sympatrically over a large range, hybrids seldom are produced. In situations where one of the parents occupies a small range, natural hybrids are likewise, restricted. For example, the rarity of both *S.* × *casei* and *S.* × *farnhamii* nothosubsp. *bellii* is due to the limited range of their respective parents *S. alabamenis* subsp. *wherryi* and *S. rubra* subsp. *gulfensis*. When floral periods between the two parents typically do not coincide and one of the parents has a restricted range, then the probability of progeny between the two is rare. Such is the case of *S.* × *gilpinii*.

In terms of their biological impact, rare *Sarracenia* hybrids are little more than curiosities. That is, their presence has minimal or no impact on the evolutionary trajectory of plants in their local group. However, in cases where hybrids are common, the evolutionary impact, at least with respect to the local group, can be substantial. Although there has been little or no molecular verification, it is likely, based on observable morphological variation, that introgression, resulting in hybrid swarms, occurs under these conditions. As mentioned previously, hybrid swarms appear to be present, at least in some local groups, where hybrids are common.

Acknowledgements: We thank the following for their assistance in locating requested herbarium specimens: Kent Perkins (FLAS); Layne Huiet (CHARL); Shanna Oberriter, Carol McCormick

(NCU); Alina Freire-Fierro (PH). Jan Schlauer provided detailed advice on taxonomy. No special permits were required to visit the sites described in this paper.

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Taxonomic *Utricularia* news

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Since my latest update to the account of *Utricularia* (Fleischmann 2012), a few more taxa have been described, resurrected from synonymy, or ranges of known species have been extended. These are summarized below in chronological order of publication (species accepted by the author of this text in **bold**, species considered synonyms in regular font), which today brings the total species number of *Utricularia* to at least 235 (making it the second largest genus of carnivorous plants, only rivalled by the approx. 250 species of *Drosera*).

***Utricularia brachyceras* Schltr.** (1899)

A species from the Western Cape of South Africa that has been sunken into synonymy of *U. bisquamata* by Taylor (1964, 1989) and in earlier treatments of the South African Flora. This single-flowered tiny annual from *U.* section *Calpidisca* is quite different in flower morphology (Fig. 1) however (the most obvious difference, among others, is the lack of a gibbous palate and the single-lobed stigma, see Stephens 1938) and it has been observed by the author on Gifberg and Cederberg in 2006, where it was evident to represent a distinctive species at first sight. Meanwhile, it has been resurrected from synonymy in a new account for the Cape Flora (Manning & Goldblatt 2012), a decision which is fully supported by the author.

Figure 1: The tiny annual species, *Utricularia brachyceras* growing at the summit of Gifberg, Western Cape of South Africa. The scapes of this species are always 1-flowered. Note the lack of a gibbose palate and the very short spur of the corolla. For a scale: the 5 Rand cent coin is about 21 mm in diameter. Photos by Andreas Fleischmann.

***Utricularia linearis* Wakabayashi** (2010)

In contrast to my previous treatment, and earlier comments by Allen Lowrie (pers. comms.), where we considered this taxon to represent a mere form of *U. fistulosa*, detailed studies of the plants in habitat now revealed to us that it is indeed a different species, well-separated from the latter by habit, corolla shape, and colour pattern. I agree with Lowrie (2013) to now list this as a distinct

species of *U.* sect. *Pleiochasia* from the Northern Territory, Australia, where it seems to be relatively common in some *Melaleuca*-swamps of the greater Darwin area.

Utricularia corneliana R.W.Jobson (2012) = *U. reflexa* Oliv.

This aquatic taxon has been described as a new species known from a single swamp in Queensland, Australia (Jobson 2012a), however it morphologically (and phylogenetically, Jobson 2012a) comes very close to the variable and polymorphic *U. reflexa*, a species widespread throughout tropical Africa and Madagascar (Taylor 1989). Having studied many specimens of *U. reflexa* both *in situ* in Africa and in the herbarium, I come to the conclusion that *U. corneliana* easily fits the morphological range of *U. reflexa*, and that it best should be considered the first record of that species in northern Australia (nearby: a similar range disjunction is already known for *Aldrovanda* and *U. gibba*, likewise freely floating aquatics).

***Utricularia blackmanii* R.W.Jobson** (2012)

This tropical species (named after the collector of the oldest specimens; Jobson 2012b) of the affinity of *U. dichotoma* can immediately be told apart from all but three members of *U.* section *Pleiochasia* by a hollow tubular scape in combination with multi-flowered inflorescence (*U. triflora*, *U. tubulata*, and *U. fistulosa* likewise share this character combination, but from these species it can be readily told apart by the very different corolla morphology and leaf shape; all other species of that affinity with hollow peduncles bear solitary flowers). The flowers of *U. blackmanii* resemble those of *U. dichotoma*, but differ in having a palate with five white, transversal ridges (in *U. dichtoma* 2-3(rarely more) ridges are present, these are greenish-yellow, rarely purple). The new species is endemic to northern Queensland, from where it previously has been misidentified as *U. dichotoma*.

***Utricularia jobsonii* Lowrie** (2013)

This striking addition to the North Australian endemic group of *U.* section *Enskide* (which now comprises four species, *U. chrysantha*, *U. fulva*, *U. simmonsii*, and *U. jobsonii*) resembles *U. chrysantha* in terms of habit and corolla shape (with a distinctly 4-lobed lower lip), but differs by the completely different colour pattern (having a pinkish-lilac corolla with two large, elliptic yellow or white spots on the palate). This species thus far is only known from a single locality in Queensland, northern Australia. It was named after botanist Richard W. Jobson.

Utricularia julianae Delprete (2014) = *U. tenuissima* Tutin

This "new species" from French Guiana agrees in all morphological characters with the unique *U. tenuissima* (the minor corolla differences listed fall within the natural range of that species), and hence is considered a younger synonym (the first for that species). The absolutely inappropriate difference "leaves and stolons lacking" (in flowering specimens) has been misused rather frequently in the genus *Utricularia* to separate dubious taxa. Almost all known species of terrestrial *Utricularia* can reduce the number of leaves present during anthesis to various degrees (probably depending on nutrition), especially in the annual taxa. Moreover, herbarium specimens often lack leaves as an artifact resulting from collecting the scapes by simply pulling them out of the soil, leaving the inconspicuous, easily detaching stolons and leaves behind in the ground – a fact that has been repeatedly pointed out by Taylor (*e.g.* 1964, 1989).

U. ameliae R.W.Jobson (2014) = *U. dichtoma* Labill.

***U. barkeri* R.W.Jobson** (2014)

U. fenshamii R.W.Jobson (2014) = *U. dichtoma* Labill.

***U. grampiana* R.W.Jobson** (2014)

These four taxa from south-eastern Australia have been split from the polymorphic *U. dichotoma*, based on a combination of mainly three morphological characters, namely the relative lengths of transverse ridges on the palate, corolla colour, and shape of the floral bracts. The new species *Utricularia barkeri* and *U. grampiana* clearly differ from *U. dichotoma* (*sensu* Taylor 1989) by their basiolute floral bracts – in respect to this character they resemble the Western Australian *U. paulineae,* which of course has a quite different corolla shape. *Utricularia barkeri* and *U. grampiana* differ from each other mainly by corolla colour and relative length of the ridges on the palate of the corolla lower lip. The new species *U. ameliae* and *U. fenshamii* both would classify as *U. dichotoma* following Taylor's (1989) wider circumscription of that species. Especially the spur shape (a character used to separate *U. ameliae*) is apparently quite variable in this polymorphic species. I hesitate to recognize separate species status for these two yet, and still agree with Taylor's classification here, but Jobson announced a detailed molecular study of the *U. dichotoma*-complex, which hopefully will shed more light on this affinity and the morphological plasticity of some species soon.

***Utricularia lowriei* R.W.Jobson** (2014)

A fifth member of the amazing group of "antenniferous" species with almost insect-like flowers from northern Australia (Fig. 2). These species of *U.* section *Pleiochasia* have long, antennae-like appendages on their otherwise minute flowers – in combination with a short, sack-like spur and flesh-coloured corollas certainly an adaptation to a common pollinator syndrome (perhaps sexual mimicry). *Utricularia lowriei* differs from the other members of that group by its corolla lower lip divided into three lobes, the outer two forming the upright-facing long antennae, but the inner one being further divided into three downward-facing, filiform seg-

Figure 2: The insect-like flower of *Utricularia lowriei*, growing in the Sanamere Lagoon area, Queensland, Australia. The entire flower is only about 12 mm long, including the long antennae. Photo by Richard Nunn.

ments that exceed the spur in length (hence it has the appearance of *U. dunstaniae* with a "beard"). Needless to mention that it was named in honour of Allen Lowrie, renowned Australian botanist and carnivorous plant expert.

New records:

Utricularia tenuissima was newly recorded from French Guiana (as "*U. julianae*"; Delprete 2014), *U. reflexa* for Queensland (as "*U. corneliana*"; Jobson 2012a), making it the first record of that species in Australia. *Utricularia costata* has been discovered at Natal, coastal Rio Grande do Norte state of north-eastern Brazil by carnivorous plant enthusiast Gabriel Santos (http://www.carnivoras.com.br/lagoas-de-natal-t3529-70.html; last accessed 8 Dec. 2014). So far the species was only known from a disjunct range in Bolívar state of southern Venezuela, and from Roraima, Pará, and Mato Grosso states of Brazil (Taylor 1989), but it seems to be much more widespread and is possibly often overlooked due to its small size (see *e.g.* records from Goiás state, F. Rivadavia, pers. comms.). The range of the rarely found annual aquatic *U. warmingii* (thus far known from Venezuela, Bolivia, and from the vast floodplains of the Pantanal, Brazil; Taylor 1989) also can be extended, as a population was recently discovered near the town of Yopal, department of Casanare, Colombia, at lowland site at the foothills of the Andes (P. Gonella and F. Rivadavia, pers. comms.) – the closest known localities of the species are situated *ca.* 350 km to the north-east in Apure state, Venezuela.

Acknowledgements: I want to thank Fernando Rivadavia, Allen Lowrie, and Jan Schlauer for numerous taxonomic discussions, and for common field trips, and Paulo Gonella for pointing out the online photographs of *U. warmingii* from Colombia to me.

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Drosera × Dork's Pink a man-made pygmy *Drosera* hybrid between *Drosera lasiantha* and *Drosera callistos*

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Keywords: *Drosera* × Dork's Pink Hancock & Lowrie, *Drosera lasiantha*, *Drosera callistos*, pygmy *Drosera* hybrid, Australian pygmy *Drosera*, man-made pygmy *Drosera* hybrids.

Abstract: *Drosera* × Dork's Pink Hancock & Lowrie (Figs. 1, 2, 3, & 5) is the first man-made pygmy *Drosera* hybrid to be acknowledged in the literature (Lowrie 2014). The hybrid is a cross between *Drosera lasiantha* Lowrie & Carlquist (female parent) (Lowrie & Carlquist p. 100, 1992; Lowrie p. 192, 1998) and *Drosera callistos* N.G. Marchant & Lowrie (male parent) (Marchant & Lowrie p. 321, 1992; Lowrie p. 30, 1989). This hybrid was produced in the spring of 2000. The hybridization materials and methods are recorded; a description of the hybrid is presented; the parent plants as well as the hybrid are photographically illustrated; and the etymology for "Dork's Pink" is explained.

Materials & Methods.

The man-made hybrid *Drosera* × Dork's Pink was made by John Hancock (co-author of this paper), of Eukey near Stanthorpe, Queensland, between *Drosera lasiantha* Lowrie & Carlquist being the female parent and *D. callistos* N.G. Marchant & Lowrie being the male parent.

In the spring of 2000, at the start of the Australian pygmy *Drosera* flowering season, the crossing of these two species was undertaken. Through these endeavours the beautiful hybrid, named *Drosera* × Dork's Pink was created. The materials and methods used to produce this hybrid are recorded in the steps 1 to 7 as follows.

Figure 1: Close up of the flowers of the man-made hybrid *Drosera* × Dork's Pink. Photo by John Hancock.

1. Each species of the pollen parent *Drosera* was allocated a different colour of cotton thread; *e.g.* for *Drosera callistos*, orange was used.
2. When pollinated, the pedicel of the recipient *Drosera* flower (the female parent), was tied with a piece of thread of the corresponding pollen donor (the male parent) colour.
3. In this way, it was possible to pollinate different flowers on the same flowering scape with pollen from several species, in each case indicating the pollen donor with species-specific coloured thread. At the end of flowering, the pollen recipient plant looked like a Christmas tree, with all its pedicels tied in various colours of cotton thread.
4. When all the flowers had dried and the seed capsules turned brown, each cross was collected separately.
5. In the spring of 2001, these crosses were planted with each cross assigned to a separate container with no special treatment.
6. Out of all the crosses made (which were numerous), only one hybrid germinated. This resulted from a cross between *Drosera lasiantha* (female parent) and *Drosera callistos* (male parent).
7. When it came to flowering, waiting for the first bud of this hybrid to open seemed to take forever. When it did open, it had twice the number of petals expected and a beautiful pinkish colour. All the flowers of that season each had over 5 petals. The following season, the flowers reverted to their normal 5 petals each.

Description

A fibrous-rooted perennial herb, plant forming a compact rosette, 1.5–2 cm in diameter, appressed closely to soil surface. Stem 5–10 mm long, covered with remains of previous seasons' growth. Active leaves 12–18 per rosette; petiole 4–5 mm long, 0.7–0.8 mm wide for most of its length, narrowing to 0.5–0.6 mm wide at lamina, lenticulate in section ca. 0.3 mm thick, sparsely scattered with minute, translucent white glands on the abaxial surface, as well as margins, adaxial surface glabrous. Lamina broadly elliptic, 2.3–2.5 mm long, 1.8–2 mm wide, adaxial surface with insect-catching glands positioned around margins and smaller glands within, abaxial surface moderately covered with translucent white trichomes bearing translucent white apical glands. Stipular bud ovoid, shaggy, 3–4.5 mm long, 3–4 mm in diameter at base; stipules 4.3–4.5 mm long, 3–3.5 mm wide, 1.3–1.5 mm wide at base, 3-lobed; central lobe lacerated into 3 segments, central one shortly divided into 5 laciniae at apex, lateral ones each shortly divided into 3 laciniae at apex; lateral lobe outer margins ± entire, laciniate across apex with 3 laciniae, innermost lacinia equal in length of central lobe. Gemmae ovate, ca. 1.3 mm long, ca. 1.3 mm wide, ca. 0.9 mm thick. (Fig. 6) Inflorescence 1 per leafy rosette, 4.5–7 (mostly 6–7) cm tall including peduncle, forming a crowded 10–18-flowered scorpioid cyme; peduncle basal portion sparsely covered with translucent white glandular trichomes, glandular density increasing towards the apex and throughout the inflorescence; pedicels 1.8–2mm long, semi-erect in sterile fruit, moderately covered with translucent white glandular trichomes ca. 0.1 mm long. Bracts mostly absent, shortly filiform when present. Sepals ± broadly elliptic or broadly ovate, 2.8–3 mm long, 1.3–1.5 mm wide, margins entire, apex irregularly serrate, moderately covered with translucent white glandular trichomes ca. 0.2 mm long. Petals adaxial surface pinkish orange, black at base and extending a little upwards along the mid vein, together (as 5 petals) appearing overall star-shaped and surrounded by red flaring, abaxial surface pink, with distinctive red radiating and branching venation, obovate, margins entire, apex ± slightly irregularly crenate, 7–8 mm long, 4–4.5 mm wide. Stamens 5, 1.5–2 mm long; filaments black-

Figure 2: Side view of the man-made hybrid *Drosera* × Dork's Pink plant (left); and cluster of *Drosera* × Dork's Pink plants with their scapes arising bearing juvenile flower buds (right). Photos by John Hancock.

Figure 3: Overhead view of the flowers in a pot of man-made hybrid *Drosera* × Dork's Pink plants. Photo by John Hancock.

ish maroon; anthers and pollen yellow. Ovary blackish maroon, broadly obovoid, 0.6–0.7 mm long, 0.8–0.9 mm in diameter. Styles 3, blackish maroon, horizontal, terete, 0.5–0.6 mm long, ca. 0.1 mm in diameter; stigmas reddish maroon, slightly curved above the horizontal, clavate, 1.5–1.6 mm long, dilating towards apex to ca. 0.2 mm in diameter, then tapering to ca. 0.1 mm near the rounded apex, papillose. Seeds absent (a sterile hybrid).

Figure 4: "Dork" the blue Cattle Dog bitch. Photo by John Hancock.

Etymology

The epithet, "Dork's Pink" honours John Hancock's Blue Cattle Dog bitch, "Dork" who died of cancer in 2002 and the colour "pink" after the principal base colour of the flowers of this man-made pygmy *Drosera* hybrid.

Notes

In 2010, one of us (AL) delivered some presentations on Australian carnivorous plants at the 8th International Carnivorous Plant Conference at Hortus Botanicus Leiden, The Netherlands. In their greenhouse a number of pots full of beautiful, man-made pygmy *Drosera* hybrids were observed. Following inquiries, revealed that the hybridizer responsible for these crosses was located in Germany. On returning to Australia, (AL) was able to track down Dieter Kadereit, of Offenbach, Germany, directly.

Dieter is now an important research colleague and has been provided with new pygmy *Drosera* material to work with. Importantly, this material is of good provenance, with full collection data and associated herbarium vouchers attached.

Figure 5: Front view of the flowers (left); and back view (right) showing the dark reddish veining on each of the petals. Photos by Allen Lowrie.

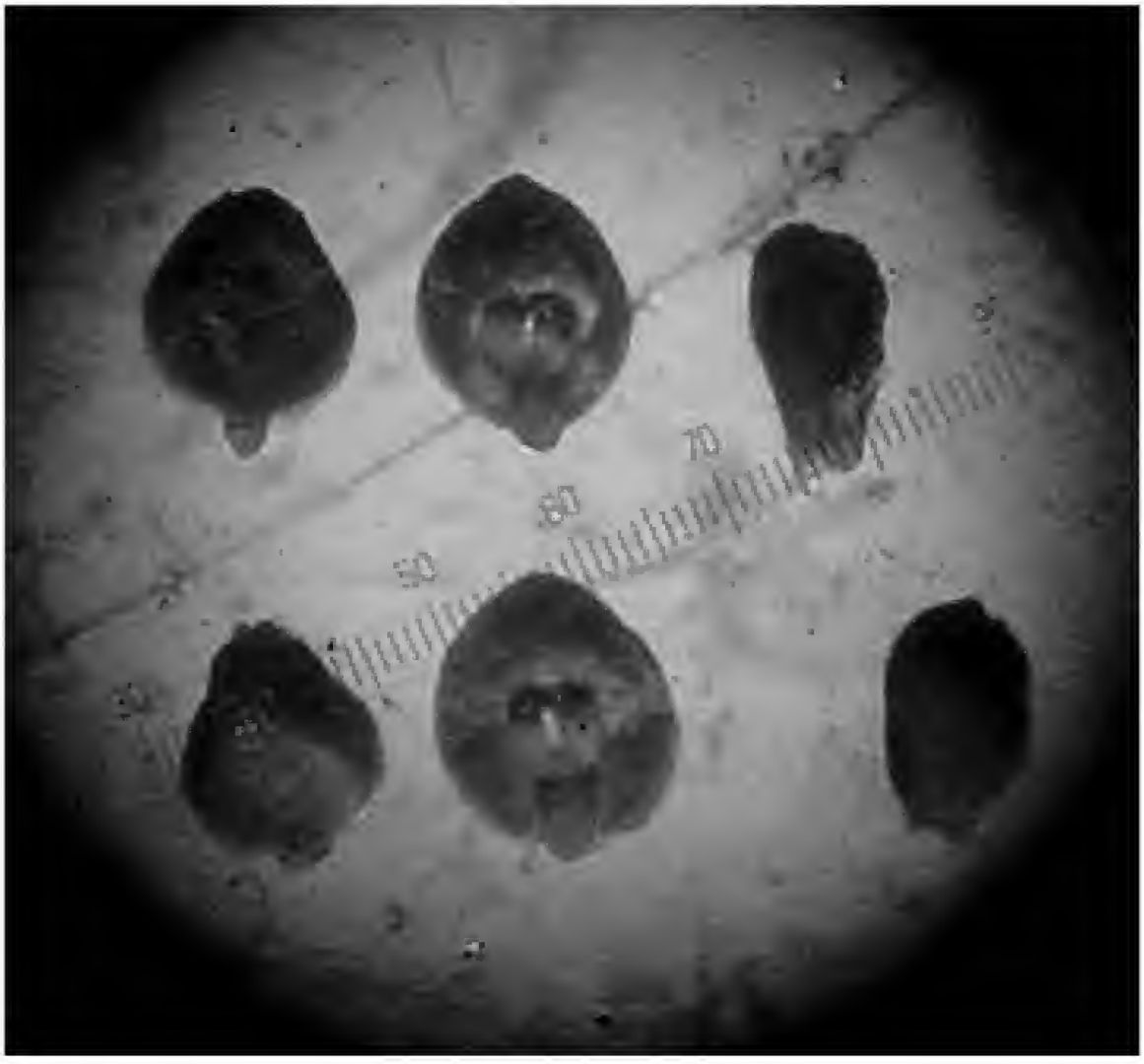

Figure 6: Micrograph of the gemmae of *Drosera* × Dork's Pink. Each set of three showing from left to right: back view of gemma; front view of gemma with embryonic root contained in a transparent tube like sheath with two juvenile leaves ready to unfurl once the gemma is in its growing position on the soil; side view of the gemma, note the wart-like appendages on the apex of the gemma. Scale between numbers 40, 50, 60, etc. = 1 mm. Micrograph photo by Allen Lowrie.

Dieter is currently experimenting with various pygmy *Drosera* crosses. Seed set between quite unrelated pygmy *Drosera* crosses is proving to be extremely low, and often only one or two potentially viable seeds are produced per cross. At the time of the *Drosera* × Dork's Pink breeding period in the year 2000 it was also established that only very few viable seeds were ever produced with crosses between two different pygmy *Drosera* species.

Under the controlled conditions of horticulture, this is not an issue, as even one plant successfully raised from seed can, when mature, be quickly propagated once gemmae production is initiated. In a few seasons, these single hybrids can be amplified into a large quantity of plants, all exact clones of the first.

Investigations to date have shown that when one uses either *Drosera omissa* or *D. pulchella* as a parent, the seeds from that cross are likely to be viable and easy to germinate. This is probably a legacy of these species' special ability to increase their numbers rapidly following drought. They are

able to generate a new population of plants very quickly once conditions improve, as the seeds of these species have few requirements in order to be induced into germinating. Given a little moisture and appropriate temperatures, they start to germinate rapidly. This is doubtless an asset for the continued survival of the species in nature, and is valuable in cultivation.

Most Australian carnivorous plant seeds remain in a state of dormancy for as long as it takes for all the right conditions to be in place for germination. Many species require fire, or the chemicals generated by smoke, to instigate the germination process. It is species with these difficult to germinate seeds that make hybrid seed germination very difficult. Experiments to find the right methods to unlock the dormancy of these pygmy *Drosera* species are ongoing, and include chemical inducement as well as simulated stratification.

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The 10th ICPS Conference 2014, Cairns, Australia

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This year's conference was held in Australia as a coproduction of the Australasian CPS, the Australian CPS, and the Victorian CPS. Many people from all over the world came to listen to a host of excellent lectures, exchange ideas, meet with old friends, and also meeting some people for the first time face to face (Fig. 1). This article is a short overview of the conference; official proceedings will follow at a later date as some presentations involved ongoing studies.

I was given the privilege of opening the conference and I started then, as I will do now, with thanking the people involved in the organization of this conference. Setting up a conference is hard work, as I know from experience, and I was impressed with the results. A very special thank you is richly deserved by Michelle Leer, who handled most of the administration and general paper pushing for this conference. Michelle, magnificent job, expertly done!

The location for the conference was a comfortable room in the botanical garden of Cairns. The room was filled to capacity with people there to interact about what is sometimes their work, sometimes a hobby, but always a passion. Topics for the lectures ranged from cultivation through conservation up to the latest in research and were delivered by an international and impressive array of speakers.

I will not get ahead of things and actually produce a full synopsis of all the conference lectures at this point. I'll just give an impression of the type of lectures that were given and the conference in general.

Figure 1: The 10th ICPS Conference attendees. Photo by Jeremiah Harris.

ICPS director of conservation & research and host Greg Bourke kicked off with a pleasantly relaxed tour of Carnivorous Australia to put everybody in the right frame of mind. Using stunning pictures, Greg gave a nice overview of the diversity of this island continent with its many habitats.

Next up was another Aussie favorite, Adam Cross. Adam was quick to point out to all present that as stunning as our beloved plants are, they are also very vulnerable to habitat destruction. We see a reduction of more than 50% in wetland area over the last two centuries. As a large portion of carnivorous plants depends on wetland habitats and current initiatives for protection and (if possible at all) restoration are inadequate to halt the decline. The message delivered was to step up local and regional initiatives for cp's to ensure a decent representation in global conservation.

In this same conservation theme, Robert Cantley presented the birth of the IUCN Carnivorous Plant Specialist Group to the world after two years of preparation. This was a favorite topic of mine, as during the 2010 ICPS conference the wish to reactivate this specialist group was one of the things discussed. A specialist group can take on many conservation related tasks, but as Rob quickly pointed out, the main focus for now is to update the IUCN red list of endangered species for carnivorous plants. Good progress is actually being made. Rob came with the preparation work done by five people in the hope of recruiting volunteers to either do actual work for the group (specialist members) or lent their support (general members). Support is important as the size of the group weighs heavily when it comes to importance and priority in the IUCN universe. While the first major score had been made in recruiting Sir David Attenborough as a Patron, Rob left the conference quite pleased with 29 members in his group and even a species already evaluated (Dr. Cross practicing the evaluation process at midnight). Since then a few posts on forums and Facebook has increased the number of members and, with that, the group will soon become more visible. (If you haven't joined, please do so. You'll be updated with developments and best of all it's free: http://www.iucn-cpsg.org).

In the category science, Katja Rembold showed the work being done on the mapping of *Nepenthes*. Data on the distribution of *Nepenthes* species is represented in digital maps and identify the regions with the highest amount of endemism and diversity. That the islands of Borneo and Sumatra featured prominently surprised nobody, but closer inspection gave much more detail and pointed to specific and sometimes unexpected regions. Publication of this work is therefore eagerly awaited.

Three lectures went into the relations that plants have with their environment. Ch'ien Lee went over feeding strategies like capturing detritus and animal droppings. Most of us will have seen his iconic picture of a *Tupaia* using the facilities of *Nepenthes rajah* and he had many more in the same league to show us.

Caroline Schöner spoke on a more specific part of these relations by looking at the interaction between carnivorous plants and animals by addressing subjects as parasitism and mutualism. Michael Schöner followed up on that by presenting the first results of their research into the relations between *Nepenthes hemsleyana* and *Kerivoula hardwickii* (that's a kind of bat, folks).

More general, but still *Nepenthes* oriented, were the talks by Gary Wilson on *Nepenthes* research in Austro-Papua and Alistair Robinson on *Nepenthes* taxonomy of Palawan (Philippines). Charles Clarke rounded out the *Nepenthes* discussions with a talk that focused, according to him, on "some additional interesting information that the previous speakers didn't address" (he phrased that actually a bit more Aussie-style himself by the way).

Luckily for those of us not obsessed by Asian weeds, there were also some good lectures on real carnivorous plants (just kidding!).

Mason McNair gave his view on the nomenclature of *Sarracenia* and I can safely say that we won't have heard the last shot fired in that discussion. Mason is actually working on a book on the subject and no matter if you agree or not, the discussions and reasoning will make it an interesting

debate which will certainly land right in the middle of the different "needs" of commercial (and hobbyist) horticulture versus more strict botanical science.

Andrej Pavlovic gave a detailed lecture on the costs and benefits of the electrical signaling used by *Dionaea muscipula*. A technical subject, but the clear presentation guided everyone through it.

Going more back to the start of things, Andreas Fleischmann delivered a lecture on the evolution of carnivory in plants. In a lecture supported not only with great pictures, but also with clear diagrams, the audience was shown how carnivory developed at least seven times independently in flowering plants. This resulted in carnivorous plants covering 18 genera and at least 800 species that we know of at this time. A very good lecture and mandatory insight for everybody who is into carnivorous plants beyond the basic level of "that's a nice plant I want to grow".

Finally, on the science front, Allen Lowrie threw down the gauntlet for the next generation. He guided us along his many observations on *Stylidium* and challenged everybody to prove them to be carnivorous as he suspects is the case in at least some of the species based on said observations.

Field reports were also represented with Jan Schlauer taking us on a tour of Andalucía, Spain and showing the habitats of *Drosophyllum lusitanicum* and many *Pinguicula*'s like *P. lusitanica*, *P. nevadensis*, and *P. mundii*. Naoki Tanabe and Koji Kondo also showed us *Pinguicula* in the field, specifically *P. macroceras* and *P. ramosa* in Japan.

The final category of lectures contained two talks that can be classified as "Cultivation". Drew Martinez gave a very interesting view on lighting in general and especially the use of LED lighting. With the savings (power, environment, and wallet) that LED's enable now and promise for the future, this is information many growers, whether they be professionals or hobbyists, will want.

Jeremiah Harris also gave a lecture that many people will wish they would have been able to attend. He focused on several plant species that are notoriously hard to grow and told us how he manages to have these species thriving in his collection.

Besides these lectures for the conference attendants, there were two talks aimed at the general public. First of course, there was the official presentation of Allen Lowrie's magnum opus on the carnivorous plants of Australia and there was a general carnivorous plant lecture set up for the visitors of the botanical garden that was delivered by "Füzzy" Mijmark as only he can tell it.

Besides all of this, in my view, the real importance of conferences like these is lots and lots of exchanging of ideas and information ranging from little tips to actual information about current research that might be useful to research being done by the attendants/speakers. This, yet again, illustrates that no matter the fact that while we are not the biggest group (certainly not compared to the number of people involved in, say orchids) and despite many forums and e-mail, there is just no substitute for a face to face meeting over coffee (or beer).

On top of this all came, of course, the joy of spending time with all these "birds of a feather", many of them old friends. A highlight that certainly deserves mentioning was the traditional conference dinner. After a pleasant boat ride on a smooth (at least to most of us) Cairns harbor, we went to a local restaurant named Ochre. The thing that makes this restaurant special is the fact that the menu consists of what is commonly known as "bush food". In other words: kangaroo, wattle seeds, bush tomato, and the likes. Highly recommended and actually quite delicious.

After these three intense days came the optional field trips, but that is another story told in the following article.

I hope this quick overview will inspire some of you to attend the next conference in 2016.

Field tripping with the ICPS
a visit to far northern Queensland

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After the successful 10th ICPS conference in Cairns, I joined the two field trips that were available to the conference participants.

The first of those was a daytrip to Mount Bartle Frere to look for *Drosera schizandra*. As this was only a daytrip, more people managed to come onto this trip than the longer one that was to follow to Cape York. Just about all of the conference participants were loaded up in two small buses for a trip to the highest mountain of Queensland. The mountain stands 1622 meters high and is named for Sir Henry Bartle Frere, a former president of the Royal Geographical Society.

The slopes of this mountain are covered with rainforest and as such this is not a common place to look for a sundew, certainly not in Australia. However, *D. schizandra* is one of the "Three Sisters" from North Queensland, (the others being *D. adelae* and *D. prolifera*) that like it more shady than most of their relatives.

I was prepared for a nasty climb but actually I needn't have worried. The plants were not near the top but still in the lower ranges of the mountain and the buses actually took us, somewhat sliding and whining, to sort of a parking spot were a trail started.

Greg Bourke and Richard Nunn had moved out ahead of us and had cleared the trail of the biggest obstacles so now it just came down to following a trail with only mild ups and downs and with a few "attractions" along the way. Mostly these were trees across the trail that couldn't be walked around so the choice was over or under. The really nasty one was a spot where the trail had washed away, and the only option was to pass it by clinging to trees and go hand by hand while searching for footing (and checking for thorns, spiders, snakes, and whatever else before you put your hand or feet there).

A little further we found lots and lots of the plants we came for. The habitat was a bit of a surprise. Some were clinging to the rock face; others were sitting in the leaf litter. Some stood alone and others formed large clumps. What was immediately noticeable was that the plants that were growing in the light were considerably smaller than the ones in the shade. Actually, some of the plants in the shade were giants, considerably larger than a hand spread out (Fig. 1).

The ground was drier than expected, but it had been not very wet the last few days and actually we were in the dry season so that explained something. We sure saw enough evidence to suggest that rain and wind could get pretty nasty up here.

Figure 1. *Drosera schizandra* on Mount Bartle Frere.

After taking lots and lots of pictures, we hiked back. Unfortunately the growing spots of the other sisters were too far away, being to the north and south of Cairns, so we couldn't visit those. There was time to take a walk around a crater lake which had us meeting stinging trees (just how long did your hand hurt Andreas?), a python, and we visited a large curtain fig before returning home.

That evening was a sad goodbye to those who wouldn't be making the big field trip, but as some of those were going to be whacking around in New Guinea and other places it just came down to choices.

Now for the big trip. A full week of travelling up the Cape York Peninsula! There were 23 CP explorers from countries as far apart as Japan, Belgium, Australia, USA, New Zealand, and of course myself from The Netherlands. All of us were to be driven around in a specially adapted 4x4 bus (something like the so called "Overlanders" they use in Africa) by a real barefoot bushman named Gary, the driver/guide/cook.

As I said earlier, we were taking this trip in the dry season and that had several advantages. The first and most obvious from the start was that there weren't that many mosquitos, leeches, and other nasty things around as could have very well been the case. Actually on the whole trip the bug spray came out just once. That was pleasant as it is much easier to keep the blood level in your alcohol in check when you are not being sucked dry. The other advantage started to dawn upon us as we traveled further. While at several points we were wading through knee deep (and deeper) water to get at the plants, there was no way we could have visited this place in the wet season. The best illustration for that was when we crossed the Wenlock River and noticed a sign at least 15 meters up in a tree stating that people had been there in a boat during the wet season of 2003. A snorkel on your truck isn't going to be much use in those conditions.

The trip was a bit of a mixture of a solid basis of known locations and a couple of spots we just gave a try because they looked promising. If I have to sketch plant and animal life at the Cape, I would say that there is an incredible variation of life, much of which is unique to the area. However, the density of that life is not very high, with a few exceptions. Some things that we knew were there we didn't find, while on the other hand *Utricularia chrysantha*, *Drosera serpens*, and *D. burmannii* were just about everywhere.

So enough for the general remarks; now back to the trip. The first stop was a nice waterhole with water lilies and some water birds we just spotted while driving along. Nice spot and good to get our feet wet and our eyes in, but apart from some lost *Utricularia gibba,* there was not much to be found.

The second spot brought us more interesting plants. A check of some notes prompted an instruction to the driver to take off into some bone dry land on a barely visible track. Who would go look for CP's in such a spot? However, it soon became clear that there was a small stream behind some more dense vegetation. Splashing through some ankle deep water we found several plants, including *Stylidium austrocapense*, *S. tenerum*, *D. burmannii*, *U. chrysantha*, *U. caerulea*, *U. minutissima* and even a possibly new species of *Utricularia*…as it was tiny, there was no way to be sure in the field (Fig. 2).

Our first camp was at Musgrave. No need to set up tents as the company we were using (Heritage Tours) had a permanent camp here. Like most small clusters of population in this

Figure 2. Greg Bourke with possible new species of *Utricularia*.

area there was a small airstrip (if a plane needs to land, you have to chase away the cattle first) and a quick walk down said airstrip produced large amounts of *D. serpens*, *D. burmannii*, and *D. petiolaris*. In the general area we also found *Stylidium delicatum* and the unavoidable *U. chrysantha*.

Next day was a big drive to Elliot Falls/Twin Falls. We arrived just in time to set up our tents (no permanent camp this time) and have a quick swim and look around with the hour or so daylight we had left. Our campsite was roughly in the middle, so those who went to one side came to Elliot Falls and those who went the other way came to Twin Falls. We found *Nepenthes mirabilis* growing all along the banks at both places and there is something to be said for having a swim amongst the *Nepenthes* pitchers (especially after sitting in a bus for most of the day).

The morning greeted us with heavy rain….dry season? Not really! I actually found out later that the wet and dry season division is a European thing. The local aboriginals recognize 6 seasons! We took down the tents and drove off without much further exploring, though I did see 3 species of ant plant thanks to our driver who knew exactly where they were.

Next came a long drive, the crossing of the Jardine River that really brought us to the actual remote north and onwards to the real carnivorous highlight of this trip, a bog area known as Jacky Jacky (named for an aboriginal guide of Edmund Kennedy during the days of great explorations). Here we found *D. petiolaris*, *D. serpens*, *D. spatulata*, *N. mirabilis*, *N. tenax*, *N. rowaniae*, *U. chrysantha*, *U. lasiocaulis*, *U. bifida*, and *U. caerulea*. A special treat, but extremely difficult to find and even harder to get a halfway descent picture of was *Utricularia quinquedenta*. Though in flower this tiny plant just was very hard to spot as the flowers were hardly bigger than the sand grains the plants were standing amongst.

Figure 3. Four species in one spot: *Drosera serpens, D. spatulata, Utricularia chrysantha,* and *Nepenthes mirabilis*.

The finding of *Byblis liniflora* rounded out the display at this carnivorous heaven and we finished the day at a prepared camp at Seisa.

The following day was set up for touristy things. We stayed at the same camp Seisa for two nights and drove to the actual northern tip of the Australian continent to have a look around and take pictures with the famous sign saying exactly that. We also stopped at a place where there used to be a camp. As the water source of this camp might yield some carnivores, it was worth a try.

Unfortunately the whole area was one big pig wallow. If there was ever any discussion that hogs might be just as big an imported pest problem as rabbits that argument was now settled…they are far worse. The whole area was completely cleared of vegetation and bore a remarkable resemblance to freshly ploughed fields. The rest of the day we relaxed.

Next morning brought a nice surprise; a Palm Cockatoo (*Probosciger aterrimus*) was nice enough to pose a little for us. The bird was hidden from view from the better camera angles when considering the light, but just to have a look at this magnificent and large black and red bird was a great start of the day.

The road took us to a boggy area to look at one specific plant, a *Nepenthes*. This plant is known as "mini-tenax" to some, but there are those who wish to name it as a separate species. Not being a *Nepenthes* grower myself, I will leave a judgment of the validity of that idea to others. The location was special enough and while a reasonable shot could be obtained from more or less dry land, some actually were willing to risk crocs and other nasty things by going knee-deep in the mud and vegetation that was at least as high and often much higher as the mud was deep. I'm happy to report that all who ventured in made it out alive, though Glen had a nasty argument with some wasps; the perils of exploration. At the edge of this swamp we also found some *D. petiolaris* and *D. spatulata*.

Next came a drive to Fruit Bat Falls. Though close to and superficially similar to Eliot and Twin falls, the general agreement was that this was a much prettier place. It had a nice deep swimming hole with the falls plunging down into it and upstream one could take a nice walk through crystal clear knee-deep (mind the holes!) water (Fig. 4).

As we had more time and more importantly more daylight at this location than our previous falls visit, we managed to have a good look around and found a nice area with plants. Along the stream we found *Nepenthes mirabilis*, *U. chrysantha*, *U. gibba*, *D. serpens*, *D. burmannii*, and *D. spatulata*. However, the big prize at this location was *Byblis aquatica* growing just a few steps from the plateau most people use to go into the swimming hole.

We also found a Cane Toad (*Rhinella marina*), which was a few moments later a late Cane Toad, as this is yet another invasive pest and a very bad one at that. It kills not only many small local species by eating them, but kills even more native predators by being deadly poisonous.

Figure 4. Robert Gibson, Mason McNair, and Carson Trexler exploring near Fruit Bat Falls.

Camp that night was at Bramwell Station. This very large cattle ranch gets some serious extra income by operating a really nice campground. Again camp had already been set up. A bell rang to announce happy hour and while we enjoyed our beer, a guy stepped up with a microphone and started telling about the history of the station. That was a nice touch and later it turned out that he was the one man band/singer/DJ that

was to entertain the campers that night. However we didn't spend much time listening as our driver had set up a huge barbeque and we enjoyed a steak dinner with the group. By the time we were finished eating most went to bed and not to the bar, which tells you how bloody tired we all felt.

Figure 5. Blue-winged Kookaburra.

Next morning was a long drive back to Musgrave where we had stayed before, basically it was the same route we had taken before (there are no other options) so nothing really new on this day besides some nice birds, including a Blue-winged Kookaburra (*Dacelo leachii*) (Fig. 5). No CP's were to be seen before we got back to Musgrave. Some of us took the time to get a couple of extra shots of the plants we had already found before, most however just relaxed after a long ride.

The morning of our last day left us a bit sad on going back to Cairns. However, our driver had a couple of surprises in stock for us. From Musgrave to Cairns there are a couple of more tracks so we could take another route if we wanted. So we did.

This route took us first to a really nice lake surrounded by woods. Lots of water birds, including Magpie geese (*Anseranas semipalmata*) sitting in the trees. The area was not that boggy in itself, but some visiting wild pigs had turned large parts into deep mud. Luckily the water plant zone was more or less intact and a check of the water's edge revealed a nice group of *U. aurea*.

Next came a drive to more arid land, the habitat that comes to mind when most people think of outback Australia. We did some stops and found some very nice non-carnivorous plants including *Nymphoides indica*, a small water lily with frilled flowers and the local name "White Snowflakes" that would be a bestseller for everyone with a tropical garden.

The next surprise had more of a bite. In all honesty, while we were constantly mindful of crocodiles (specifically saltwater crocodiles (*Crocodylus porosus*) as the other species of croc that occurs here (*Crocodylus johnstonii*) is not considered dangerous to humans), up to now they had left us pretty much alone. That was of course nice for our safety, but not so much fun if you want to see things. Our driver had just the solution. We stopped along a river and sneaked (for as much as a group of 23 can sneak) through the vegetation to the river's edge a couple of 100 meters away. On the opposite bank we got our crocodiles. Mrs. Croc wasn't dressed for visitors and quickly slid her 3-meter something body in the water and went into hiding. Mr. Croc wasn't that shy. Actually, he was pretty much convincingly communicating: "I'm well over 5 meters, this is my spot and what are you going to do about that mate?"

After filling a lot of SD-card space, we boarded and drove back to Cairns.

After saying our goodbye's to the driver we freshened up, had dinner and said goodbye to everybody as we were all leaving on different flights, at different times, and to different places. I went on a two-day trip around the world to go home, others left for such interesting places as Papua New Guinea to do some more field tripping with Ch'ien Lee or to climb a couple of mountains to look for more Asian weeds...oops I mean lovely *Nepenthes* species.

Anyway, it was a great trip and I had a lovely time. My thanks to those who made it possible by preparing this trip, driver Gary for putting up with a bunch of plant geeks and that lovely bunch of nutcases that I like to call friends who have made this trip so much fun.

When the next conference comes, don't hesitate, come!

New cultivars

Keywords: cultivar, *Dionaea muscipula* 'Farou', *Dionaea muscipula* 'Carniplant', *Dionaea muscipula* 'Purple Haze', *Sarracenia* 'Legacy', *Nepenthes* 'H.R. Giger'.

Dionaea muscipula 'Farou'

Submitted: 9 June 2014

Dionaea muscipula 'Farou' has different shades of pale green, however, the digestive glands are reddish as in the wild type (Fig. 1). The petioles are long and elongated. The traps remain small. The trap margins are thinner and darker green than the trap interior. The teeth along the trap margins are comparatively short and slightly inflexed, those near the trap apex and base being shorter than those at half length of either margin. Each trap has 4 transparent trigger hairs (instead of 6 in the wild type).

I named *Dionaea muscipula* 'Farou' after my dog in April 2014. To maintain the unique features of this cultivar it should be reproduced by vegetative means only.

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Figure 1: *Dionaea muscipula* 'Farou' plant and trap showing four transparent trigger hairs.

Dionaea muscipula 'Carniplant'

Received: 27 November 2014

I discovered *Dionaea muscipula* 'Carniplant' in February 2014 in my greenhouse, being part of an order from a Holland producer. After 9 months in cultivation, new plant leaves maintain the same characteristics and are considered stable. The marginal teeth are fused in a few groupings, and some of them can be crossed (Fig. 2). The first traps of the growing season may have 3 trigger hairs per lobe, but eventually producing 4-5 functional trigger hairs per lobe; a total of 8-10 for each trap.

The most similar cultivar is probably *Dionaea* 'Triton', but this can be distinguished easily by its fused distal ends of the traps. *Dionaea* 'Carniplant' differs from *Dionaea* 'JA1' in the number of trigger hairs (6 in *Dionaea* 'JA1' and 8-10 in *Dionaea* 'Carniplant') and trap color when grown in

Figure 2: *Dionaea muscipula* 'Carniplant'.

direct sunlight (*Dionaea* 'JA1' is mostly green and *Dionaea* 'Carniplant' turns red). The plant also differs from *Dionaea* 'Fused Tooth' in that in *Dionaea* 'Carniplant', not all of the marginal teeth are fused (Fig. 2), has larger petioles, and a higher number of trigger hairs per lobe.

I have introduced leaf cuttings in tissue culture to propagate the cultivar and maintain the unique features.

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Dionaea muscipula 'Purple Haze'

Submitted: 3 July 2014

Dionaea muscipula 'Purple Haze' (Fig. 3 and Front Cover) is a unique cultivar I developed by transferring the pollen from the anthers of a *Dionaea* 'Low Giant' to the stamens of a *Dionaea* 'Akai Ryu' on 4 May 2005, resulting in the production of 37 seeds that were immediately harvested and planted on 23 June 2005. A total of 29 seeds germinated and were allowed to grow for five months. During that time, I observed one unique seedling exhibit traits that were different from the other seedlings, specifically, darkest color and largest trap size. I named this young *Dionaea* 'Purple Haze'.

Dionaea 'Purple Haze' grows leaves horizontally and low to the ground throughout the growing season. A mature plant has never displayed a leaf base longer than the length of its trap. More specifically, this plant maintains a unique leaf base to trap length ratio of approximately 1:1 in the first three years of growth, followed by a ratio of 0.7:1 as the plant matures. A fully mature six-year-old plant will develop stout robust marginal lashes with a leaf base never exceeding 2.75 cm long and a trap size length range of 3-4 cm.

The entire plant of *D.* 'Purple Haze' exhibits a deep purplish red color (RHS 71A) when grown in 8 hours or more of direct sunlight. This also includes the flower stalk and sepals. A very limited amount of a green/yellow coloration band is present on the trap's outer edge only during the early stages of trap development and again as the plant prepares to enter winter dormancy. Otherwise, *D.* 'Purple Haze' maintains a uniform deep purple color throughout the entire growing period. Figure 3 (right) shows plants from leaf pullings in their third season of growth.

There are a number of red *Dionaea* cultivars listed in Bailey and McPherson (2013), but *Dionaea* 'Purple Haze' has the following unique characteristics, some of which are missing in the other red cultivars:

Figure 3: *Dionaea muscipula* 'Purple Haze' (left) and plants from leaf pullings in the third season of growth (right).

1) Color – Deep Purple Red (RHS 71A) covers entire plant throughout the growing season.
2) Growth pattern – Always grows leaves horizontally and low to the ground, never erect.
3) Leaf base length – Never exceeds 2.75 cm even on fully mature plants.
4) Trap length – Averages 3 to 4 cm on mature plant.
5) Leaf base length to trap length ratio – Leaf base length never exceeds its trap length.
6) Trap marginal lashes – Normal length but more robust and a little thicker at base of lash.

The differences are as follows:

- 'Bohemian Garnet' comes close to 'Purple Haze' in #1 (Color) and passes #2 (Growth pattern), but fails #6 (Marginal lashes) due to sawtooth.
- 'DC All Red' fails #3 (Leaf base length) and also #5 (Leaf base length to trap length ratio). Also maximum leaf size is stated to be 12.5 cm with traps 3 to 3.5 cm which also supports the failure of #3 and #5.
- 'Petite Dragon' fails #4 (trap length) as implied by the name, 'Petite'.
- 'Red Burgundy' fails #2 due to erect summer leaves and fails #3 and #5 with leaf bases that can reach up to 10 cm in length.
- 'Red Pluto' fails #1 since the color is listed as reddish brown and also fails #3 and #5 since leaf base can reach a length of 5 cm along with a trap length of 3.2 cm. Traps also develop a mutative form where the distal ends are partly fused.

Although *Dionaea* 'Purple Haze' is capable of producing a fair amount of seeds by sexual reproductive means through self-pollination, this method does not guarantee that all unique features identifying the cultivar shall be faithfully reproduced. This cultivar must be reproduced vegetatively by rhizome cutting or leaf pulling in order to assure retention of all unique characteristic traits.

'Purple Haze' is a song written and recorded by the late legendary rock star Jimi Hendrix and inspired the cultivar's name, due to the vivid purple hue of the traps when illuminated by the early morning sunlight.

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Sarracenia 'Legacy'

Submitted: 24 September 2014

Sarracenia 'Legacy' is a cross of *S.* 'Leah Wilkerson' × *S.* 'Adrian Slack' produced by Brooks Garcia in 2008, which I grew out from seed. Out of a very small handful of seeds that Brooks sent to me that year, I was only able to germinate two seedlings. *Sarracenia* 'Legacy' was the only plant to survive and grow from that particular batch.

I coined the name *Sarracenia* 'Legacy' in 2012. The word "legacy" refers to a gift, or something of value passed on from one generation to another. The name is derived from a combination of factors. *Sarracenia* 'Legacy' commemorates the individuals the parent plants are named after, as well as their work with the furtherance and cultivation of this majestic genus. "Legacy" also pays homage to the influence that the parent plants have, and will continue to have on *Sarracenia* cultivation for generations to come. On a more personal note, the name also pays tribute to those who have inspired me in my botanical endeavors. I am deeply thankful for the botanical passion, vision, and drive that has been passed into my life by so many wonderful individuals.

Figure 4: *Sarracenia* 'Legacy' pitchers and flower.

Young pitchers start off predominantly greenish, with traces of white in the upper portion. As pitchers mature under intense light, the white top portion of the pitcher intensifies and spreads, and a strong prominent dark red splotch develops in the throat (Fig. 4 and Back Cover). These features have been stable in both outdoor and greenhouse conditions. The pitchers of *Sarracenia* 'Legacy' typically attain a height of 60-75 cm however larger pitchers have been observed. Blooms are yellowish-cream with light hints of pink on the sepals (Fig. 4). This plant should be reproduced only by vegetative means to ensure that its unique characteristics are maintained.

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Nepenthes 'H.R. Giger'

Submitted: 9 October 2014

Nepenthes 'H.R. Giger' (Fig. 5) is a fantastic specimen of the hybrid *N. lowii* × *spectabilis* that was produced by Geoff and Andrea Mansell of Exotica Plants, Australia, and purchased as a small plant in 2010 from Tony Paroubek at Exotic Plants Plus, USA.

The hybrid parentage of *N.* 'H.R. Giger' gives this cultivar a strong blending of the characteristics of both of the parents. The pitcher mouth is not as exaggeratedly open and wide as that of *N. lowii*, but it is more so than *N. spectabilis*. The pitcher body is elongated and tubular, yet not straight-bodied as that of *N. spectabilis* with some hints of the contorted features of *N. lowii* as well as its woody texture. The striping on the peristome goes from yellow through various degrees of red and the pitcher

Figure 5: *Nepenthes* 'H.R. Giger' upper (left) and lower (right) pitchers.

Figure 6: *Nepenthes* 'H.R. Giger' peristome teeth.

Figure 7: *Nepenthes* 'H.R. Giger' is a nice specimen in cultivation.

coloration is deeply speckled with dark chocolate-like colors against a red background from exposure to high levels of lighting for the lower pitchers, while the upper pitchers are still quite deeply colored and retain the great peristome striping. Both the lower and the upper pitchers exhibit large amounts of spikes under the pitcher lids with the lower pitchers having prominent frontal "wings" on their bodies which act as ladders for crawling insects, where the upper pitchers do not exhibit these "wings".

What distinguishes *N.* 'H.R. Giger' are the flared peristome of the pitcher mouth akin to the *N. spectabilis* parent, the exhibiting of large peristome teeth, and the numerous hairy spikes under the pitcher lid akin to the *N. lowii* parent (Figs. 5 & 6).

The unusually numerous lid spikes, somewhat contorted body and deep coloration even on the upper pitchers, are all distinguishing characteristics that make this individual an outstanding example of the *N. lowii* × *spectabilis* hybrid. Also, the plant grows large like *N. lowii*, and readily vines like *N. spectabilis*, and produces pitchers rather frequently, making it a rewarding specimen for cultivation (Fig. 7). It can grow well in somewhat warm temperatures, but exhibits the best characteristics in cooler temperatures due to the *N. lowii* parentage. The plant has flowered and is a male.

I named this plant *Nepenthes* 'H.R. Giger' in October 2014 in memory of the recently passed Surrealist Artist from Switzerland who is perhaps best-known for creating the Alien creature for director Ridley Scott's 1979 film "Alien", which earned him an Academy Award for the Best Achievement in Visual Effects for his designs of the film's title character, the stages of its lifecycle, and the film's extraterrestrial environments. As the innovator of the nightmarish "Biomechanical" style, he had a long and well-respected career as a globally influential fine artist in the disciplines of painting, sculpture, industrial design, and interior design. When viewed extremely close and at an angle, the intersection of the peristome teeth and the lid spikes of the cultivar create a frightening alien landscape akin to those imagined by the late H.R. Giger (Fig. 6). This, and because the plant is darkly colored and has such a nightmarish appearance, I feel that it would be a fitting tribute to name the cultivar for the late visionary genius Hans Ruedi Giger.

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